Final Report

JANUARY 1989

EVT 11-89

MIL-STD-1660 TESTS FOR GENERAL DEFENSE CORPORATION VALUE ENGINEERED CHANGE PROPOSAL (GDC VECP) ON WOODEN PALLETS FOR PA116 CONTAINERS (VECP 0520E0014R-C

PARED FOR:
Army Armament, Research
velopment and Engineering Center
N: SMCAR-ESK
k Island, IL 61299-7300

US ARMY
ARMAMENT
MUNITIONS
CHEMICAL COMMAND

US ARMY DEFENSE AMMUNITION
CENTER AND SCHOOL

EVALUATION DIVISION
SAVANNA, ILLINOIS 61074-9639

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William R. Meyer

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19. ABSTRACT (Continue on reverse if necessary and identify by block number)

The U.S. Army Defense Ammunition Center and School (USADACS), Evaluation Division (SMCAC-DEV) was tasked by the U.S. Army Armament Research, Development and Engineering Center (ARDEC), SMCAR-AEP, Picatinny Arsenal, NJ to conduct tests on a value engineering change proposal (VECP) submitted by General Defense Corporation (GDC). This report contains the procedures, results, and recommendations from the MIL-STD-1660 tests conducted. As tested, this VECP did not pass MIL-STD-1660 design requirements for unitized ammunition loads.

20. DISTRIBUTION/AVAILABILITY OF ABSTRACT	21. ABSTRACT SECURITY CLASSIFICATION
[X] UNCLASSIFIED/UNLIMITED [ ] SAME AS RPT. [ ] DTIC USERS	UNCLASSIFIED

22a. NAME OF RESPONSIBLE INDIVIDUAL	22b. TELEPHONE (Include Area Code)	22c. OFFICE SYMBOL
THOMAS J. MICHELS	(815) 273-8928	SMCAC-DEV

DD Form 1473, JUN 86 *Previous editions are obsolete.*

U.S. ARMY DEFENSE AMMUNITION CENTER AND SCHOOL
Evaluation Division
Savanna, IL 61074-9639

REPORT NO. EVT 11-89

GENERAL DEFENSE CORPORATION VECP

ON WOODEN PALLETS FOR PALLET CONTAINERS

TABLE OF CONTENTS

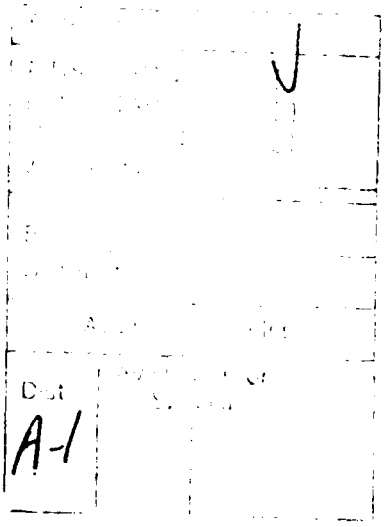
PART 1

INTRODUCTION

A. BACKGROUND. The U.S. Army Defense Ammunition Center and School (USADACS), Evaluation Division (SMCAC-DEV), was tasked by the U.S. Army Armament Research, Development and Engineering Center (ARDEC), SMCAR-AEP, to test a value engineering change proposal (VECP). This VECP was submitted by General Defense Corporation (GDC) for wooden pallets used to palletize PA116 containers. The primary change in this proposal was reduced plywood dunnage on the pallet deck. General Defense Corporation claims this change will save the Government $40,000 over the next three years. Evaluation of the test pallet was done using the procedure outlined in MIL-STD-1660, Design Criteria for Ammunition Unit Loads.

B. AUTHORITY. This test was conducted in accordance with mission responsibilities delegated by the U.S. Army Armament, Munitions and Chemical Command (AMCCOM), Rock Island, IL.

C. OBJECTIVE. The objective of this test was to assess the capability of the VECP pallet to meet Army functional and operational requirements for MIL-STD-1660, Design Criteria for Ammunition Unit Loads.



PART 2

ATTENDEES

William R. Meyer Test Engineer AV 585-8090	U.S. Army Defense Ammunition Center and School ATTN: SMCAC-DEV Savanna, IL 61074-9639
William Matthews	General Defense Corporation 10101 9th Street North St. Petersburg, Florida 33716

PART 3

TEST PROCEDURES

The test procedures outlined in this section were extracted from MIL-STD-1660, Design Criteria for Ammunition Unit Loads, 8 April 1977. This standard identifies five steps that a unitized load must undergo if it is considered to be acceptable. The five test that were conducted on the test pallet are synopsized below.

1. STACKING TESTS. The unit load shall be loaded to simulate a stack of identical unit loads stacked 16 feet high for a period of one hour. This stacking load is simulated by subjecting the unit load to a compression of weight equal to an equivalent 16-foot stacking height. The compression load is calculated in the following manner. The unit load weight is divided by the unit load height in inches and multiplied by 192. The resulting number is the equivalent compressive load of a 16-foot-high load.

2. REPETITIVE SHOCK TEST. The repetitive shock test shall be conducted in accordance with Method 5019, Federal Standard 101. The test procedure is as follows: The test specimen shall be placed on, but not fastened to the platform. With the specimen in one position, vibrate the platform at 1/2-inch amplitude (1-inch double amplitude) starting at a frequency of about 3 cycles-per-second. Steadily increase the frequency until the pallet leaves the platform. The resonant frequency is achieved when a 1/16-inch-thick feeler gage may be momentarily slid freely between every point on the specimen in contact with the platform at some instance during the cycle or a platform acceleration achieves one plus

or minus zero point one G. Midway into the testing period, the specimen shall be rotated 90 degrees, and the test continued for the duration. Unless failure occurs, the total time of vibration shall be two hours if the specimen is tested in one position; and, if tested in more than one position, the total time shall be three hours.

3. EDGEWISE DROP TEST. This test shall be conducted by using the procedures of Method 5008, Federal Standard 101. The procedure for the Edgewise Rotational Test is as follows: The specimen shall be placed on its skids with one end of the pallet supported on a sill 4-1/2 inches high. The height of the sill shall be increased, if necessary, to ensure that there will be no support for the base between the ends of the pallet when dropping takes place, but should not be high enough to cause the pallet to slide on its skids when the dropped end is raised for the drops. The unsupported end of the pallet shall then be raised and allowed to fall freely to the concrete, pavement, or similar underlying surface from a prescribed height. Unless otherwise specified, the height of drop for level A protection shall conform to the following tabulation.

GROSS WEIGHT NOT EXCEEDING	DIMENSIONS ON ANY EDGE NOT EXCEEDING	HEIGHT OF DROP LEVEL A PROTECTION
Pounds	Inches	Inches
600	72	36
3,000	no limit	24
no limit	no limit	12

4. SLING COMPATIBILITY TEST. Unit loads utilizing special design for nonstandard pallets shall be lifted, slung, lowered, and otherwise handled

as necessary using slings of the types normally used for handling the unit loads under consideration. Slings shall be easily attached and removed. Danger of slippage or disengagement when load is suspended shall be cause for rejection of the unit load.

5. IMPACT TEST. This test shall be conducted by using the procedure of on the Method 5023, Incline-Impact Test of Federal Standard 101. The procedure for the Incline-Impact Test is as follows: The specimen shall be placed on the carriage with the surface or edge which is to be impacted projecting at least two inches beyond the front end of the carriage. The carriage shall be brought to a predetermined position on the incline and released. If it is desired to concentrate the impact on any particular position on the container, a 4x4-inch optional timber may be attached to the bumper in the desired position before the test. No part of the timber shall be struck by the carriage. The position of the container on the carriage and the sequence in which surfaces and edges are subjected to impacts may be at the option of the testing activity and will depend upon the objective of the tests. When the test is to determine satisfactory requirements for a container or pack, and, unless otherwise specified, the specimen shall be subjected to one impact on each surface that has each dimension less than 9.5 feet. Unless otherwise specified, the velocity at time of impact shall be 7 feet-per-second.

PART 4

TEST EQUIPMENT

1. TEST PALLET.

   a. VECP Drawing: 0520E0014 R-C

   b. Width: 40 inches

   c. Length: 44-1/2 inches

   d. Height: 52-5/8 inches

   e. Weight: 2,400 pounds

2. COMPRESSION TESTER.

   a. Manufacturer: Ormond Manufacturing

   b. Platform: 60 inches by 60 inches

   c. Compression Limit: 50,000 pounds

   d. Tension Limit: 50,000 pounds

3. TRANSPORTATION SIMULATOR.

   a. Manufacturer: Gaynes Laboratory

   b. Capacity: 6,000-pound pallet

   c. Displacement: 1/2-inch Amplitude

   d. Speed: 50 to 400 rpm

   e. Platform: 5 foot by 8 foot

4. INCLINED RAMP.

   a. Manufacturer: Conbur Incline

   b. Type: Impact Tester

   c. Grade: 10 percent Incline

   d. Length: 12-foot Incline

PART 5

TEST RESULTS

1. STACKING TEST. The test pallet was loaded to 9,000-pounds compression for a period of one hour. Periodic adjustments were made to maintain the desired stacking weight of 8,880-pounds. At the end of the one hour, no measurable distortion of the pallet was noted.

2. REPETITIVE SHOCK TEST. The test pallet successfully passed both the longitudinal and lateral transportation simulations. Duration of the test was 90 minutes for each orientation of the pallet. In order to achieve the clearance between the pallet and the transportation simulator bed, the equipment was operated at 180 rpm for the longitudinal orientation and 195 rpm for the lateral orientation.

3. EDGEWISE ROTATIONAL DROP TEST. Each side of the pallet base was placed on a beam displacing it 4-1/2 inches above the floor. The opposite side of the pallet was raised to a height of 24 inches above the floor and then dropped. This process was repeated in a clockwise direction until all four sides of the pallet had been tested. The first drop was parallel to the skids. After this drop, a bow in the pallet deck was noted which allowed the center skid to contact the floor while one end of the pallet was still being elevated by the 4-1/2 inch displacement beam. The second impact was perpendicular to the skids. After this impact, one container located in the second row from the bottom, and vertically in line with the center skid had a stacking lug disengaged. After the third impact, this stacking lug returned to its proper stacking configuration (stacking lug engaged). After this drop, the pallet deck was again bowed

similar to that described in drop one above. After the fourth and final impact, the stacking lug noted in drop two was again disengaged. Also noted after this drop was a 3/4-inch shift in the upper adapter assembly at the base end of the containers.

4. SLING TEST. The sling test consisted of four different lifting configurations using the top adapter assembly and a four-legged sling. The sling configurations used during this test consisted of a three corner, two alternate corners, two adjacent corners, and a single corner lift. After the fourth and final lift, two of the three 1-1/4" unitization straps were loose. Also noted was the upper adapter assembly wedged under the square (base end) stacking ring of one container. The affected container was located on the top outside edge of the pallet.

5. IMPACT TEST. The incline-impact tester was set to allow the pallet to travel eight feet prior to impacting a stationary wall. The pallet was rotated clockwise after each impact, until all four sides of the pallet had been tested. No damage was noted to the pallet or containers during this test.

6. END OF TEST INSPECTION. During final inspection of the pallet and containers, attempts were made to remove the projectiles from the bottom row of containers. Two of the five 120mm projectiles could not be removed. After disassembly and inspection of these containers, it was noted that the container side walls were permanently deformed at points of contact with the modified pallet deck boards. These deck boards were the design changes made by GDC in their VECP.

PART 6

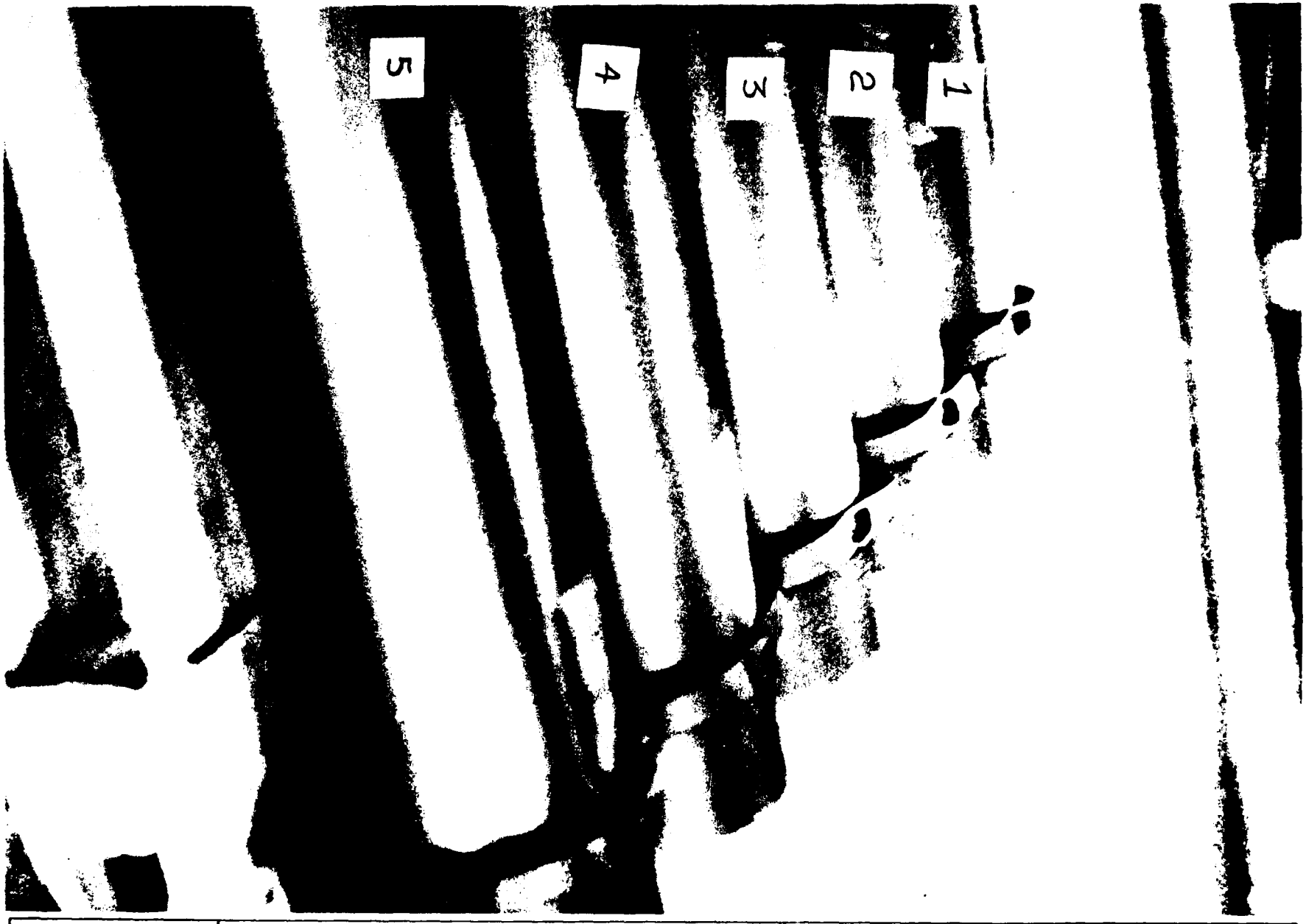
CONCLUSIONS

1. CONCLUSIONS. This VECP-designed pallet failed requirements of MIL-STD-1660. Design Criteria for Ammunition Unit Loads. This failure was due to excessive damage (denting) of several containers which results in the inability to remove two of the 120mm rounds. The four-inch-wide dents at the base end of the containers were caused by contact with modified deck boards proposed in the VECP.

2. DISAPPROVAL. Due to the damage resulting during MIL-STD-1660 tests, the VECP submitted by GDC is not approved for use. Tests conducted by USADACS demonstrated that the VECP submitted by GDC did not adequately protect the rounds.

PART 7

PHOTOGRAPHS



DEFENSE AMMUNITION CENTER AND SCHOOL - SAVANNA, IL

Photo No. 1. Shows overview of PA116 containers in contact with the VECP pallet. Container Nos. 2 and 5 were non-serviceable after testing.

DEFENSE AMMUNITION CENTER AND SCHOOL - SAVANNA, IL

Photo No. 2. Shows close-up view of container No. 2, showing permanent deformation to the square bell at the base of the container. The 120mm round could not be removed from this container in the palletized configuration.

DEFENSE AMMUNITION CENTER AND SCHOOL - SAVANNA, IL

Photo No. 3. Shows close-up view of container No. 3, note area of contact of wood dunnage proposed in the VECP and the container body.

DEFENSE AMMUNITION CENTER AND SCHOOL - SAVANNA, IL

Photo No. 4. Shows close-up view of container No. 5, note damage to the container body as a result of the VECP. The 120mm round could not be removed from this container as a result of this damage.

PART 8

APPENDIX

APPENDIX 7B

UNITIZATION PROCEDURES FOR COMPLETE ROUNDS PACKED IN CYLINDRICAL METAL CONTAINERS ON 4-WAY ENTRY PALLETS*

PA116 SERIES CONTAINER

INDEX

PALLET UNIT DATA						
ITEMS INCLUDED		HAZARD CLASSIFICATION ◐				WEIGHT
NSN	DODIC	DOT CLASS	CG CLASS	QD CLASS	COMP GROUP	(LBS)
1315- 01-250-8636	C784	B	II-B	1.3	C	2,391
01-242-4796	C785	B	II-B	1.3	C	2,061

◐ HAZARD CLASSIFICATION DATA CONTAINED IN THE ABOVE CHART IS FOR GUIDANCE AND INFORMATIONAL PURPOSES ONLY. VERIFICATION OF THE SPECIFIED DATA SHOULD BE MADE BY CONSULTING THE MOST RECENT JOINT HAZARD CLASSIFICATION SYSTEM LISTING OR OTHER APPROVED LISTING (S).

NOTICE: THIS APPENDIX CANNOT STAND ALONG BUT MUST BE USED IN CONJUNCTION WITH THE BASIC UNITIZATION PROCEDURES DRAWING 19-48-4079-20PM1002.

* SEE GENERAL NOTE "L" ON PAGE 2

REVISIONS			

DRAFTSMAN: Dia / tm — PROJ ENG: LAF / WCF — CHECKER: SMS — LOGISTICS OFFICE: W. A. [signature]

APPROVED, U.S. ARMY ARMAMENT, MUNITIONS AND CHEMICAL COMMAND: [signatures]

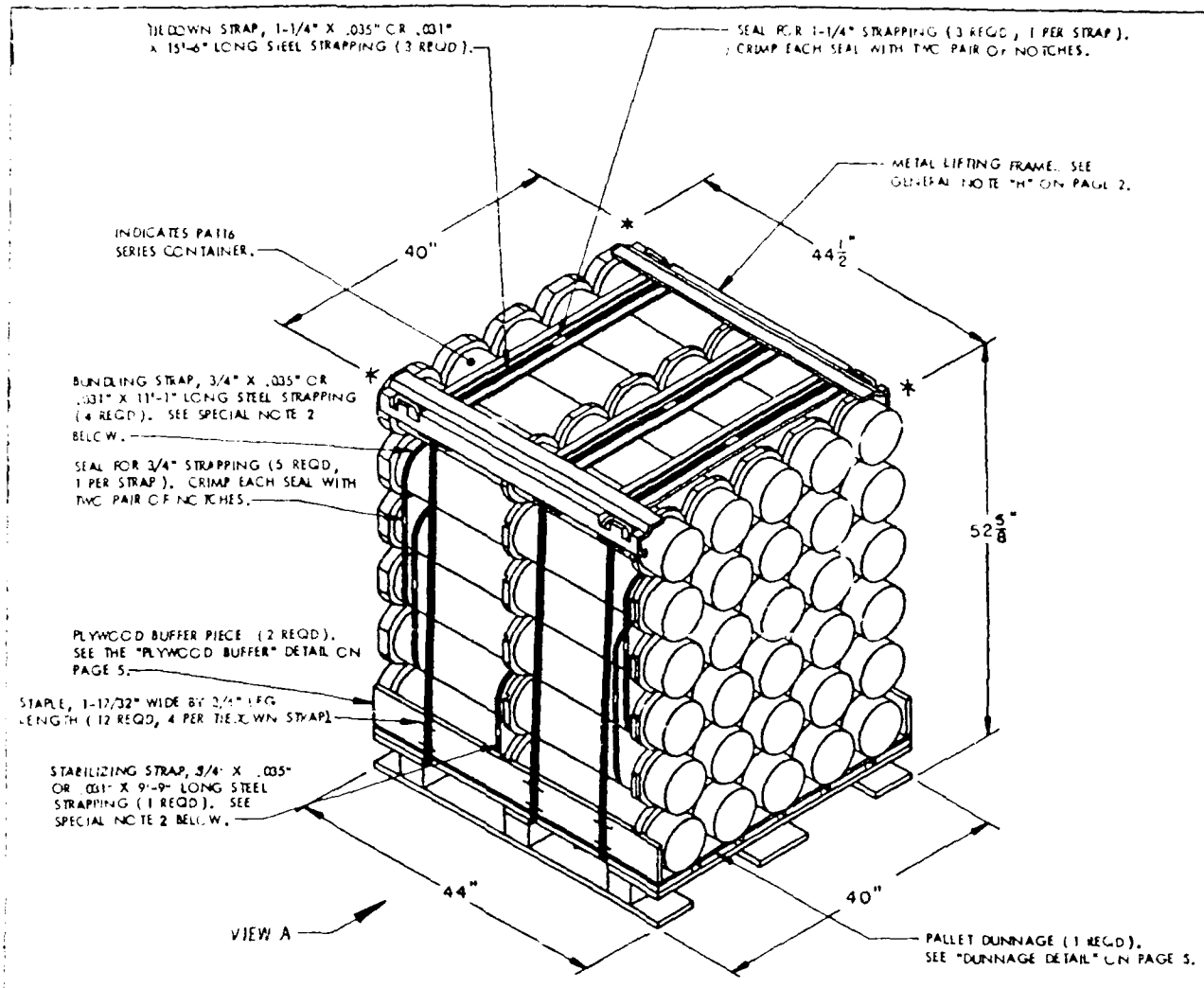
APPROVED BY ORDER OF COMMANDING GENERAL, U.S. ARMY MATERIEL COMMAND (AMC): [signature] U.S. ARMY DEFENSE AMMUNITION CENTER AND SCHOOL

U.S. ARMY AMC DRAWING

NOVEMBER 1987

CLASS	DIVISION	DRAWING	FILE
19	48	4079/ 7B	20PM 1002

DO NOT SCALE

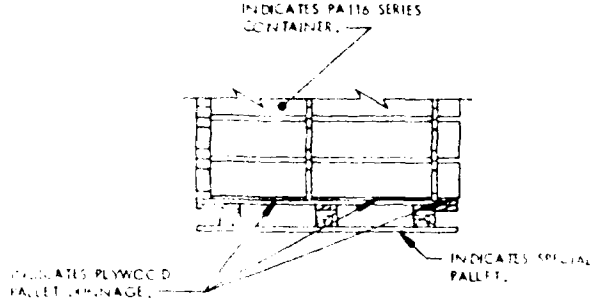


ISOMETRIC VIEW

SPECIAL NOTES:

1. ALTHOUGH THE CONTAINERS DEPICTED IN THE UNIT LOAD ABOVE ARE CONSTRUCTED WITH INTERLOCKING DEVICES, THE INTERLOCKS WILL NOT FUNCTION PROPERLY UNLESS THE CONTAINERS ARE POSITIONED SO THAT THE "PINS" OF THE INTERLOCKS ARE IN AN UPRIGHT ORIENTATION. THIS ORIENTATION WILL PRECLUDE INTERFERENCE OF THE "PINS" AND THE PLYWOOD PALLET DUNNAGE AND WILL AID IN THE PREVENTION OF CONTAINER MOVEMENT, BOTH LATERALLY AND LONGITUDINALLY, DURING SHIPMENT OF THE UNIT LOAD.

2. BUNDLING STRAPS AND STABILIZING STRAP MUST BE TENSIONED AND SEALED PRIOR TO THE APPLICATION OF THE TIE-DOWN STRAPS. ALL STRAPS MUST BE INSTALLED AS CLOSE AS POSSIBLE TO THE CONTAINER RINGS. CAUTION: STRAPS MUST NOT BE ALLOWED TO OVERLAP.



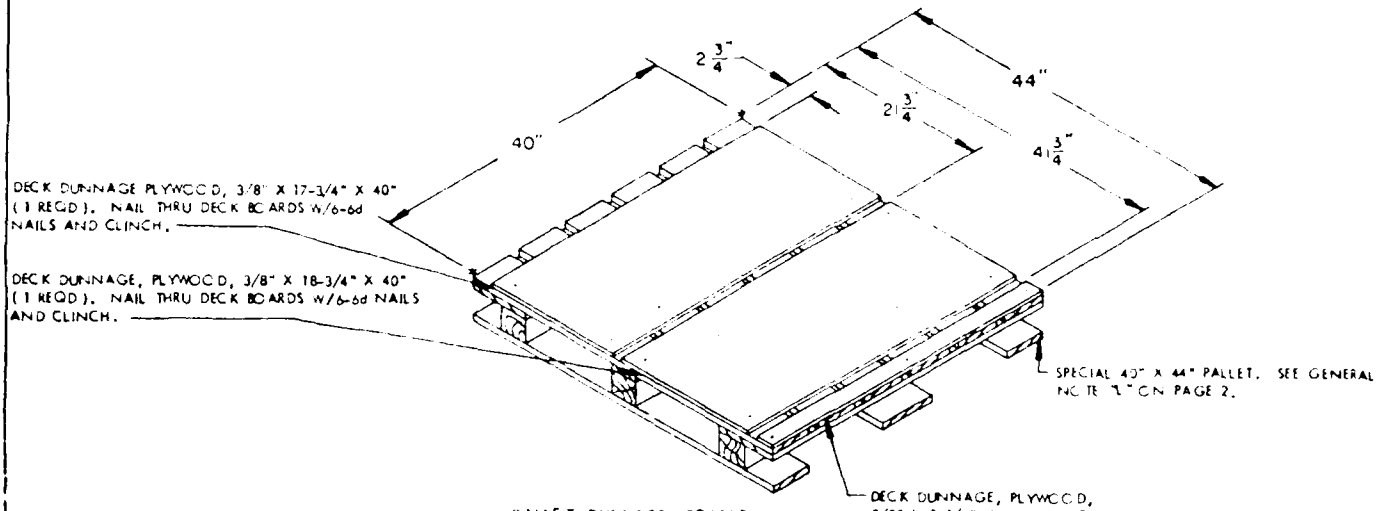
PARTIAL VIEW A

(PLYWOOD BUFFER HAS BEEN OMITTED FOR CLARITY).

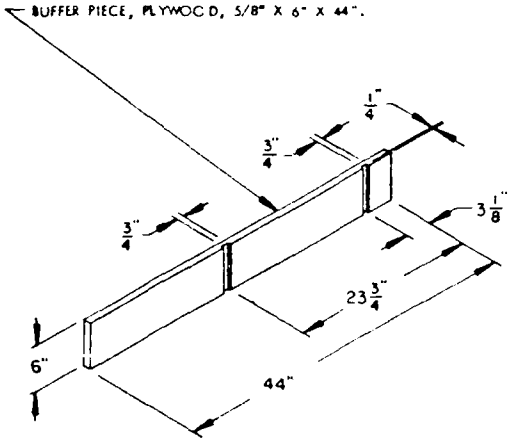
UNIT DETAIL

PAGE 4

PROJECT [illegible]



PALLET DUNNAGE LOCATION



PLYWOOD BUFFER

BILL OF MATERIAL		
NAILS	NO. REQD	[illegible]
6d (2")	15	[illegible]

SPECIAL PALLET, 40" X 44"	1 REQD	[illegible]
STEEL STRAPPING, 3/4"	54.08 REQD	[illegible]
STEEL STRAPPING, 1-1/4"	46.50 REQD	[illegible]
SEAL FOR 3/4" STRAPPING	5 REQD	[illegible]
SEAL FOR 1-1/4" STRAPPING	3 REQD	[illegible]
PLYWOOD, 3/8"	10.76 SQ FT REQD	[illegible]
PLYWOOD, 5/8"	1.7 SQ FT REQD	[illegible]
STAPLES FOR 1-1/4" STRAPPING	12 REQD	[illegible]
METAL LIFTING FRAME	1 REQD	[illegible]

[illegible] DATA

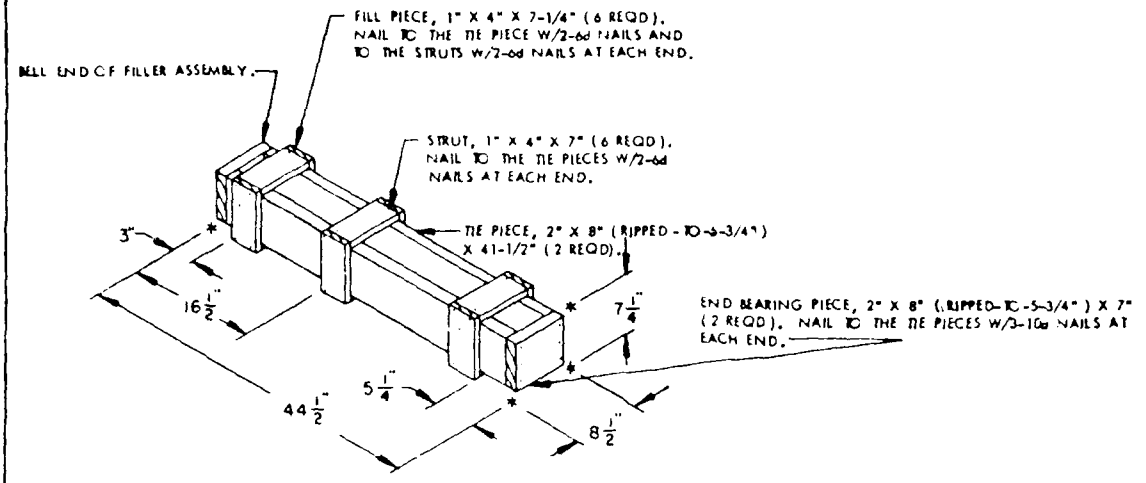
[illegible] 54.2 CUBIC FEET (APPROX.)
[illegible] 2,250 LBS (APPROX.)
[illegible] 64 LBS
[illegible] 77 LBS

[illegible] WEIGHT 2,391 LBS (APPROX.)

DUNNAGE DETAILS

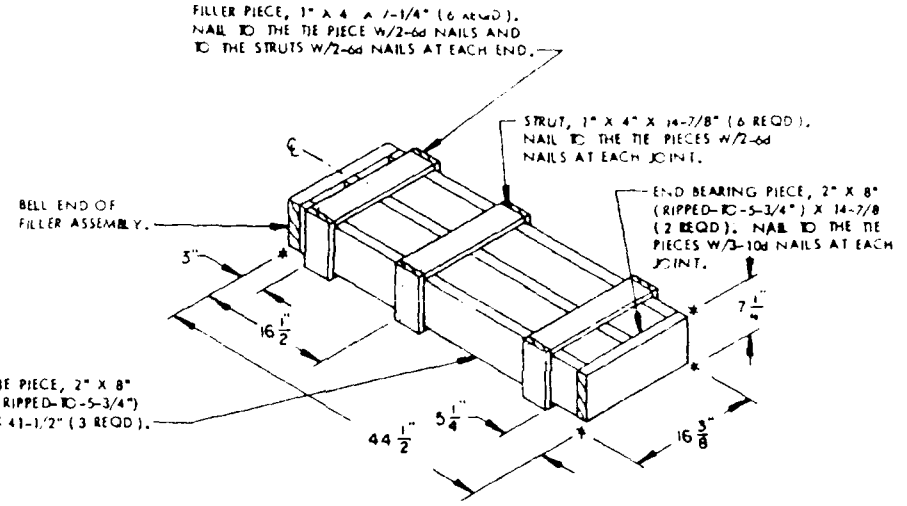
PAGE 5

PROJECT FSA 63/7B 66



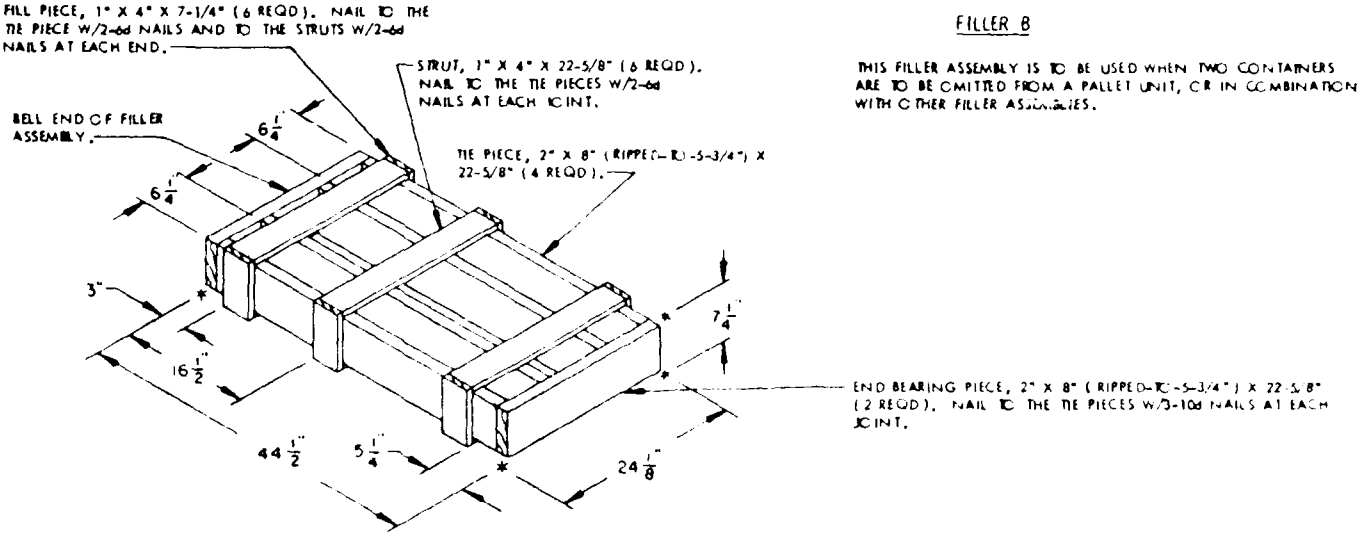
FILLER A

THIS ASSEMBLY IS TO BE USED WHEN ONE OR TWO CONTAINERS ARE TO BE OMITTED FROM A PALLET UNIT OR IN COMBINATION WITH OTHER FILLER ASSEMBLIES. SEE SPECIAL NOTES 2 AND 3 ON PAGE 6.



FILLER B

THIS FILLER ASSEMBLY IS TO BE USED WHEN TWO CONTAINERS ARE TO BE OMITTED FROM A PALLET UNIT, OR IN COMBINATION WITH OTHER FILLER ASSEMBLIES.



FILLER C

THIS FILLER IS TO BE USED WHEN THREE CONTAINERS ARE TO BE OMITTED FROM A PALLET UNIT, OR IN COMBINATION WITH A "FILLER A" ASSEMBLY.

DEPARTMENT OF THE ARMY
US ARMY ARMAMENT RESEARCH, DEVELOPMENT AND ENGINEERING CENTER
ROCK ISLAND, ILLINOIS 61299-7300

REPLY TO
ATTENTION OF

SMCAR-ESK (746-1b)

18 DEC 1988

MEMORANDUM FOR: Director, U.S. Army Defense Ammunition Center and School, ATTN: SMCAC-DEO, Savanna, IL 61074-9639

SUBJECT: Value Engineering Change Proposal (VECP) to Unitization Drawing 19-48-4079/7B

1. General Defense Corporation has submitted a VECP pertaining to the dunnage materials used on subject drawing. The VECP proposes changes to the buffer assembly, which was previously requested from this office on 28 Sep 88, and to eliminating much of the dunnage material utilized on the pallet base.

2. The VECP also incorporates tighter tolerances for the buffer assembly and dunnage components, than is required in the Basic Procedures for 19-48-4079 drawings. The VECP recommends using six additional nails per dunnage component, because of concerns indicated by the subcontractor for shipping the pallets from the manufacturer to the load plant.

3. Request that your comments/recommendations be furnished to this office at the earliest possible date, pertaining to any storage and shipment problems that may or may not be encountered with this dunnage configuration.

4. The point of contact is Mark Rehmstedt, SMCAR-ESK, AUTOVON 793-6164.

FOR THE COMMANDER:

Walter B Holcombe

Encl

WALTER B. HOLCOMBE
Act Chief, Packaging Office

DEPARTMENT OF THE ARMY
U.S. Armament Research, Development and Engineering Center
Rock Island, Illinois 61299-7300

SMCAR-ESK (746-1b)

18 DEC 1988

MEMORANDUM FOR: Director, U.S. Army Defense Ammunition Center and School, ATTN: SMCAC-DFO, Savanna, IL 61074-9639

SUBJECT: Value Engineering Change Proposal (VECP) to Initization Drawing 19-48-4079/78

1. General Defense Corporation has submitted a VECP pertaining to the dunnage materials used on subject drawing. The VECP proposes changes to the buffer assembly, which was previously requested from this office on 28 Sep 88, and to eliminating much of the dunnage material utilized on the pallet base.

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3. Request that your comments/recommendations be furnished to this office at the earliest possible date, pertaining to any storage and shipment problems that may or may not be encountered with this dunnage configuration.

4. The point of contact is Mark Rehmetedt, SMCAR-ESK, AUTOVON 793-5164.

FOR THE COMMANDER:

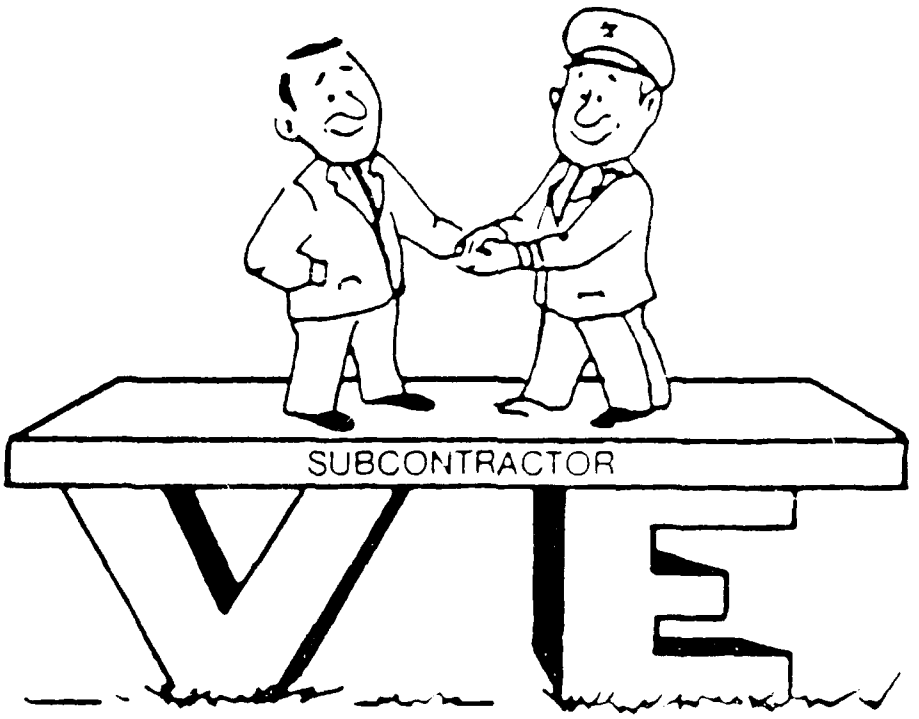
[redacted]

Encl

WALTER B. HOLCOMBE
Act Chief, Packaging Office

REDUCE PALLET DUNNAGE AREA

FINAL
VALUE ENGINEERING CHANGE PROPOSAL
NO. 0520E0014 R-C



PREPARED BY:

GENERAL DEFENSE CORPORATION
TACTICAL SYSTEMS DIVISION

VECP NO. 0520E0014 R-C

REDUCE WOOD PALLET DUNNAGE

TABLE OF CONTENTS

GINEERING CHANGE PROPOSAL, PAGE 1
E MIL-STD-480 FOR INSTRUCTIONS)

DATE PREPARED: 18 NOVEMBER 88

PROCURING ACTIVITY NO.:

ORIGINATOR NAME AND ADDRESS
GENERAL DEFENSE CORPORATION/TACTICAL SYSTEMS DIVISION
10101-9th Street North , St. Petersburg, FL 33716

2. CLASS OF ECP: I
3. JUST CODE: V
4 PRIORITY: R

5. ECP DESIGNATION

MODEL/TYPE	b. MFR. CODE	c. SYS. DESIG.	d. ECP NO.	e. TYPE	f. REV.	g. CORR
M865	0AYM6	120MM TANK AMMUNITION	0520E0014	F	-	-

6. BASELINE AFFECTED: [ ] FUNCTIONAL [ ] ALLOCATED [X] PRODUCT

7. OTHER SYS /CONFIG. ITEMS AFFECTED: [X] YES [ ] NO M831

8. SPECIFICATIONS AFFECTED - TEST PLAN

	MFR CODE	SPEC./DOC. NO.	SCN
SYSTEM			
ITEM			
TEST PLAN			

9. DRAWINGS AFFECTED

MFR CODE	NUMBER	REV	NOR NO.
28620	19-48-4079/7B-20PM1002	-	

TITLE OF CHANGE
REDUCE PALLET DUNNAGE AREA

11. CONTRACT NO. & LINE ITEM
DAAA09-88-C-0520

CONFIGURATION ITEM NOMENCLATURE
CARTRIDGE, 120MM, TPCSDS-T: M865

13. IN PRODUCTION: [X] YES [ ] NO

NAME OF PART OR LOWEST ASSEMBLY AFFECTED
UNITIZATION PROCEDURES FOR COMPLETE ROUNDS

15. PART NO. OR TYPE DESIGNATION
19-48-4079/7B-20PM1002

DESCRIPTION OF CHANGE

REDUCE AREA OF PALLET DUNNAGE ON THE M865 AND M831 WOOD PALLET.

NEED FOR CHANGE

REDUCE COST.

ELIMINATE NON-FUNCTIONAL PARTS.

PRODUCTION EFFECTIVITY BY SERIAL NUMBER
OT 1, FY '89

19. EFFECT ON PRODUCTION DELIVERY SCHEDULE
NONE

20. RETROFIT

RECOMMENDED ITEM EFFECTIVITY

c. SHIP/VEHICLE CLASS AFFECTED
NA

STIMATED KIT DELIVERY SCHEDULE

d. LOCATIONS OR SHIP/VEHICLE NUMBERS AFFECTED
NA

ESTIMATED COSTS/SAVINGS UNDER CONTRACT
See Attachment I

22. ESTIMATED NET TOTAL COSTS
-0-

SUBMITTING ACTIVITY AUTHORIZING SIGNATURE

TITLE
STEPHEN B. EHLERS
KE SYSTEMS ENGINEERING MANAGER

24. APPROVAL/DISAPPROVAL

LASS I
APPROVAL RECOMMENDED

b. CLASS II
[ ] APPROVED [ ] DISAPPROVED [ ] CONCUR IN CLASSIFICATION OF CHANGE [ ] DO NOT CONCUR IN CLASSIFICATION OF CHANGE

OVERNMENT ACTIVITY

SIGNATURE

DATE

FORM 1692

GPO 1969 O—332-10

GDC/TSD
VECP NO. 0520E0014 R-C

TECHNICAL DISCUSSION

The present TDP identifies pallet dimensions without tolerances. With producibility in mind, GDC evaluated the pallet design and developed tolerances for the identified dimensions. After full-scale layouts (max/min conditions) of the pallet and container were completed, several functional characteristics of the pallet were found to be of no value due to manufacturing tolerances. Accordingly, a design evaluation was conducted to resolve this problem.

The result of this evaluation is the enclosed VECP. This VECP proposes the following:

- Two pallet dunnage components rather than three.
- 12 nails per dunnage component rather than 6.
- Less dunnage area.
- Tighter functional tolerances.

Selection of two pallet dunnage components rather than three is based upon the tolerance range about the container middle ring. Due to the dimensioning practice in the present design of the wood pallet, it is not possible to maintain a tolerance around the middle ring which provides satisfactory functional characteristics. Accordingly, this section of the pallet dunnage was eliminated. In addition, the small strip of dunnage at the container base was eliminated since it is not required to constrain movement.

Vendor feedback has identified problems with the current design surviving shipment between the wood pallet manufacturer and the LAP facility. GDC has reviewed this problem and recommends that six (6) additional nails be used per dunnage component.

No collateral savings are associated with this VECP.

This VECP has not been previously submitted.

ENGINEERING CHANGE PROPOSAL, PAGE 3
(SEE MIL-STD-480 FOR INSTRUCTIONS)

PROCURING ACTIVITY NO.

ORIGINATOR NAME AND ADDRESS
GENERAL DEFENSE CORPORATION/TACTICAL SYSTEMS DIVISION
10101-9th Street North , St. Petersburg, FL 33716

ECP NUMBER
0520E0014 R-C

EFFECTS ON PRODUCT CONFIGURATION IDENTIFICATION, OPERATION AND LOGISTICS

(X)	FACTOR	ENCL.	PAR.
	34. EFFECT ON PRODUCT CONFIGURATION IDENTIFICATION OR CONTRACT		
	PERFORMANCE		
	WEIGHT-BALANCE-STABILITY (Aircraft)		
	WEIGHT-MOMENT (Other equipment)		
X	DRAWINGS	NOR	
	NOMENCLATURE		
	35. EFFECT ON INTEGRATED LOGISTIC SUPPORT (ILS) ELEMENTS		
	ILS PLANS		
	MAINTENANCE CONCEPT AND PLANS		
	MAINTENANCE PROCEDURES		
	INTERIM SUPPORT PROGRAM		
	SPARES AND REPAIR PARTS		
	TECH. MANUALS/PROGRAMMING TAPES		
	FACILITIES		
	SUPPORT EQUIPMENT		
	OPERATOR TRAINING		
	OPERATOR TRAINING EQUIPMENT		
	MAINTENANCE TRAINING		
	MAINTENANCE TRAINING EQUIPMENT		
	PERSONNEL		
	CONTRACT ENGINEERING TECH. SVCS.		
	VERIFICATION AND DEMONSTRATION PLANS		

(X)	FACTOR	ENCL.	PAR
	36. EFFECT ON OPERATIONAL EMPLOYMENT		
	SAFETY		
	SURVIVABILITY		
	RELIABILITY		
	MAINTAINABILITY		
	SERVICE LIFE		
	OPERATING PROCEDURES		
	ELECTROMAGNETIC INTERFERENCE		
	ACTIVATION SCHEDULE		
	OPERATING INSTALLATIONS		
	37. OTHER CONSIDERATIONS		
	INTERFACE		
	OTHER AFFECTED EQUIPMENT/GFE		
	PHYSICAL CONSTRAINT		
	OPERATIONAL COMPUTER PROGRAMS		
	REWORK OF OTHER EQUIPMENT		
	SYSTEM TEST PROCEDURES		

38. ALTERNATIVE SOLUTIONS

NONE

39. DEVELOPMENTAL STATUS

NA

40. RECOMMENDATIONS FOR RETROFIT

NA

41. MAN-HOURS PER UNIT TO INSTALL RETROFIT KITS

a. ORGANIZATION	b. INTERMEDIATE	c. DEPOT	d. OTHER
NA	NA	NA	NA

42. MAN-HOURS TO CONDUCT SYSTEM TESTS AFTER RETROFIT

NA

43. THIS CHANGE MUST BE ACCOMPLISHED

☐ BEFORE ☐ WITH ☐ AFTER THE FOLLOWING CHANGES:

NO RESTRICTIONS

44. IS CONTRACTOR FIELD SERVICE ENGINEERING REQUIRED?

☐ YES ☒ NO

45. OUT OF SERVICE TIME

N/A

46. EFFECT OF THIS ECP AND PREVIOUSLY APPROVED ECP'S ON ITEM

NONE

47. DATE CONTRACTUAL AUTHORITY NEEDED FOR

PRODUCTION _____

ILS _____

DD FORM 1 DEC 68 1692-2

S-11007

ENGINEERING CHANGE PROPOSAL PAGE 4
(SEE MIL-STD-480 FOR INSTRUCTIONS)

PROCURING ACTIVITY NO

ORIGINATOR NAME AND ADDRESS
GENERAL DEFENSE CORPORATION, TACTICAL SYSTEMS DIVISION
10101-9th Street North, St. Petersburg, FL 33716

ECP NUMBER
0520E0014 R-C

48. ESTIMATED NET TOTAL COST IMPACT (USE MINUS SIGN FOR SAVINGS)

FACTOR	COSTS/SAVINGS UNDER CONTRACT					OTHER COSTS/SAVINGS TO GOVERNMENT
	NON-RECURRING (1)	RECURRING UNIT (2)	RECURRING QUANTITY (3)	RECURRING TOTAL (4)	TOTAL (5)	(6)
a. PRODUCTION COSTS/SAVINGS						
CONFIGURATION ITEM						
FACTORY TEST EQUIPMENT						
SPECIAL FACTORY TOOLING						
SCRAP						
ENGINEERING, ENGR. DATA REV						
REVISION OF TEST PROCEDURES						
QUALIFICATION OF NEW ITEMS						
SUBTOTAL OF PROD. COSTS/SAVINGS						
b. RETROFIT COSTS						
ENGINEERING, ENGRG. DATA REV.						
PROTOTYPE TESTING						
KIT PROOF TESTING						
RETROFIT KITS						
PREP. OF MWO/TCTO/SC/ALT INSTR.						
SPECIAL TOOLING FOR RETROFIT						
CONTRACTOR FIELD SERVICE ENGRG.						
GOV'T PERSONNEL INSTALLATION						
TESTING AFTER RETROFIT						
MODIFICATION OF GFE						
QUALIFICATION OF MODIFIED GFE						
SUBTOTAL OF RETROFIT COSTS						
c. INTEGRATED LOGISTIC SUPPORT COSTS/SAVINGS						
SPARES/REPAIRS PARTS REWORK						
NEW SPARES AND REPAIR PARTS						
RETROFIT KITS FOR SPARES						
OPERATOR TRNG. COURSES						
MAINTENANCE TRNG. COURSES						
REV. OF TECH. MAN./PROGRAMMING TAPES						
NEW TECH MAN./PROGRAMMING TAPES						
PREP. OF MWO/TCTO/SC/ALT INSTR						
INTERIM SUPPORT						
MAINTENANCE MANPOWER						
SUBTOTAL OF ILS COSTS/SAVINGS						
d. OTHER COSTS/SAVINGS						
e. SUBTOTAL COSTS/SAVINGS						
SUBTOTAL UNDER CONTRACT						
f. COORDINATION CHANGES BY OTHER CONTRACTORS						
g. COORDINATION CHANGES BY GOVERNMENT						
ESTIMATED NET TOTAL COSTS/SAVINGS						*

DD FORM 1692-3

* See Attachment I

NOTICE OF REVISION (NOR)

(SEE MIL-STD-480 FOR INSTRUCTIONS)

This revision described below has been authorized for the document listed.

1. ORIGINATOR NAME AND ADDRESS	DATE	MFR. CODE	NOR. NO.
GENERAL DEFENSE CORPORATION, TACTICAL SYSTEMS DIVISION 10101-9th Street North, St. Petersburg, FL 33716		0AYM6	

2. TITLE OF DOCUMENT	3. MFR. CODE	4. DOCUMENT NUMBER
UNITIZATION PROCEDURES FOR COMPLETE ROUNDS PACKED IN CYLINDRICAL METAL CONTAINERS ON 4-WAY ENTRY PALLETS.	28620	19-48-4079/78-20PM1002
	5. REVISION LETTER (CURRENT) _ (NEW)	6. ECP NO. 0520 E0014 R-

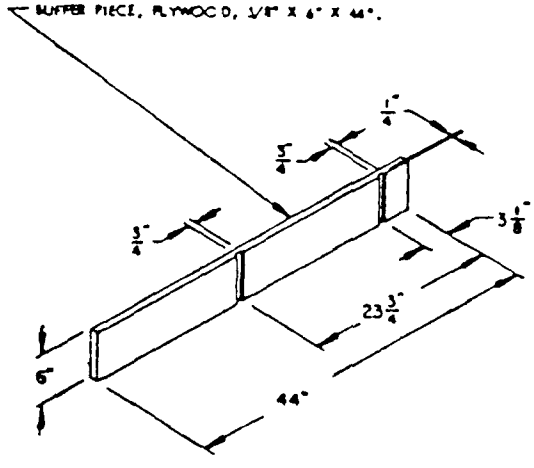
7. CONFIGURATION ITEM (OR SYSTEM) TO WHICH ECP APPLIES

CARTRIDGE, 120MM, TPCSDS-T: M865

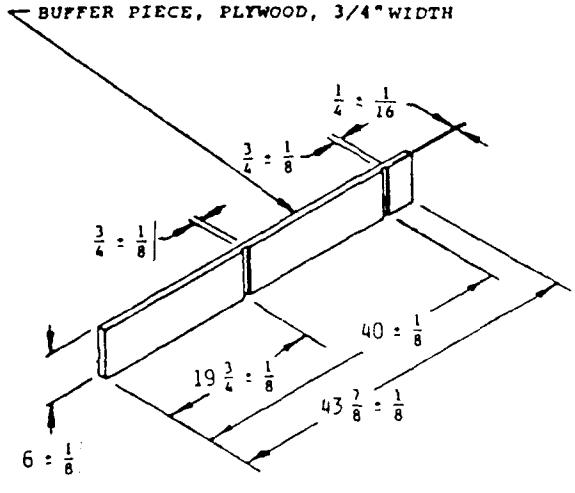
8. DESCRIPTION OF REVISION

MODIFICATIONS MADE TO SHEET 5:

OLD:



NEW:



9. THIS SECTION FOR GOVERNMENT USE ONLY

A. CHECK ONE

☐ EXISTING DOCUMENT SUPPLEMENTED BY THIS NOR MAY BE USED IN MANUFACTURE.

☐ REVISED DOCUMENT MUST BE RECEIVED BEFORE MANUFACTURER MAY INCORPORATE THIS CHANGE.

☐ CUSTODIAN OF MASTER REVISION AND FY

B. ACTIVITY AUTHORIZED TO APPROVE CHANGE FOR GOVERNMENT	SIGNATURE AND TITLE
10. ACTIVITY ACCOMPLISHING REVISION	REVISION COMPLETED (SIGNATURE)

DD FORM 1695

NOTICE OF REVISION (NOR)

(SEE MIL-STD-480 FOR INSTRUCTIONS)

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1. ORIGINATOR NAME AND ADDRESS	DATE	MFR. CODE	MOD. NO.
GENERAL DEFENSE CORPORATION, TACTICAL SYSTEMS DIVISION 10101-9th Street North, St. Petersburg, FL 33716		0AYM6	

2. TITLE OF DOCUMENT	3. MFR. CODE	4. DOCUMENT NUMBER
UNITIZATION PROCEDURES FOR COMPLETE ROUNDS PACKED IN CYLINDRICAL METAL CONTAINERS ON 4-WAY ENTRY PALLETS.	28620	19-48-4079/78-20PM100
	5. REVISION LETTER (CURRENT) - (NEW)	6. ECP NO. 0520EC014 R-

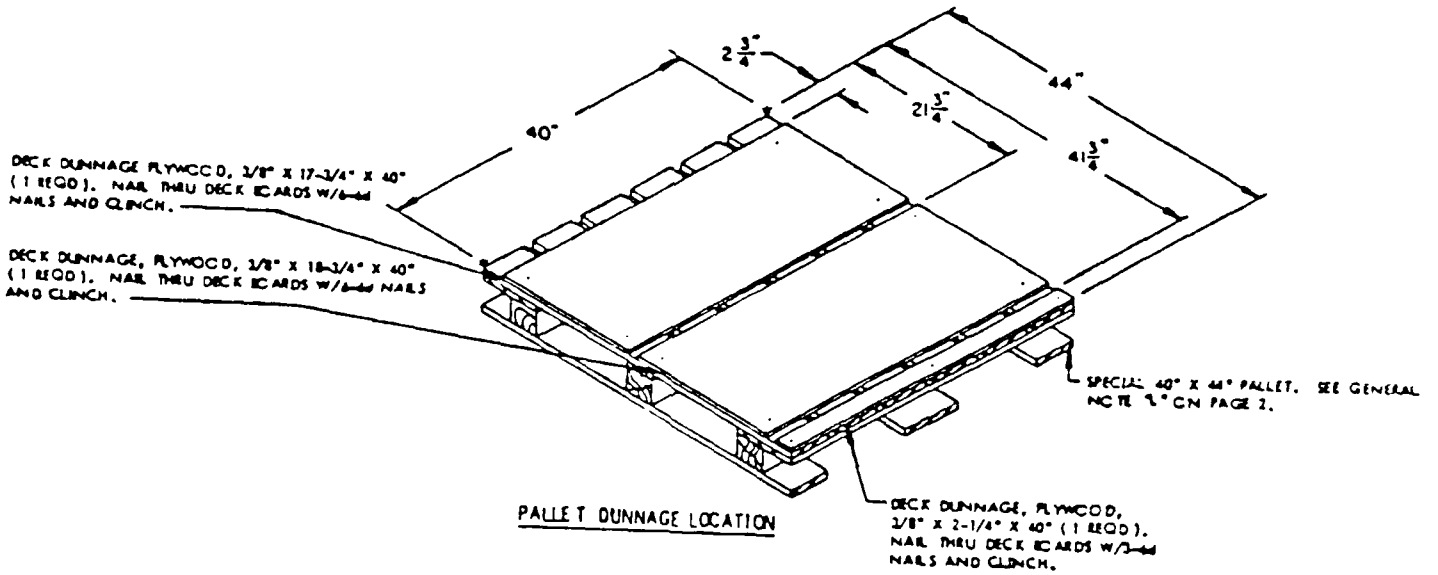
7. CONFIGURATION ITEM (OR SYSTEM) TO WHICH ECP APPLIES

CARTRIDGE, 120MM, TPCSDS-T: M865

8. DESCRIPTION OF REVISION

MODIFICATIONS MADE TO SHEET 5 (SHEET 1 OF 2):

OLD:



PALLET DUNNAGE LOCATION

9. THIS SECTION FOR GOVERNMENT USE ONLY

4. CHECK ONE

☐ EXISTING DOCUMENT SUPPLEMENTED BY THIS NOR MAY BE USED IN MANUFACTURE.

☐ REVISED DOCUMENT MUST BE RECEIVED BEFORE MANUFACTURER MAY INCORPORATE THIS CHANGE.

☐ CUSTODIAN OF MASTER DOCUMENT SHALL MAKE ABOVE REVISION AND FURNISH REVISED DOCUMENT TO:

8. ACTIVITY AUTHORIZED TO APPROVE CHANGE FOR GOVERNMENT	SIGNATURE AND TITLE	DATE
10. ACTIVITY ACCOMPLISHING REVISION	REVISION COMPLETED (SIGNATURE)	DATE

DD FORM 1695

NOTICE OF REVISION (NOR)

(SEE MIL-STD-480 FOR INSTRUCTIONS)

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GENERAL DEFENSE CORPORATION, TACTICAL SYSTEMS DIVISION 10101-9th Street North, St. Petersburg, FL 33716		0AYM6	

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	5. REVISION LETTER (CURRENT) - (NEW)	6. ECP NO. 0520E0014 R-C

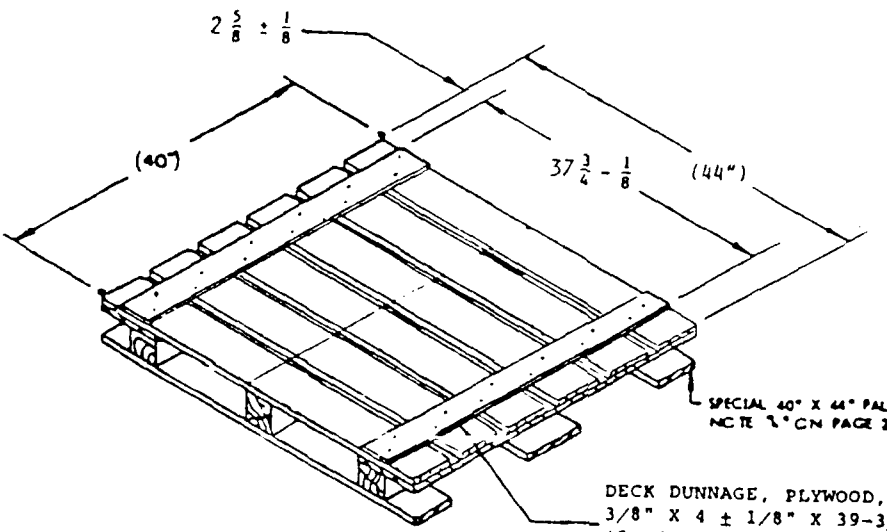
7. CONFIGURATION ITEM (OR SYSTEM) TO WHICH ECP APPLIES

CARTRIDGE, 120MM, TPCSDS-T: M865

8. DESCRIPTION OF REVISION

MODIFICATIONS MADE TO SHEET 5 (SHEET 2 OF 2):

NEW:



PALLET DUNNAGE LOCATION

9. THIS SECTION FOR GOVERNMENT USE ONLY

A. CHECK ONE

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☐ CUSTODIAN OF MASTER DOCUMENT SHALL MAKE ABOVE REVISION AND FURNISH REVISED DOCUMENT TO:

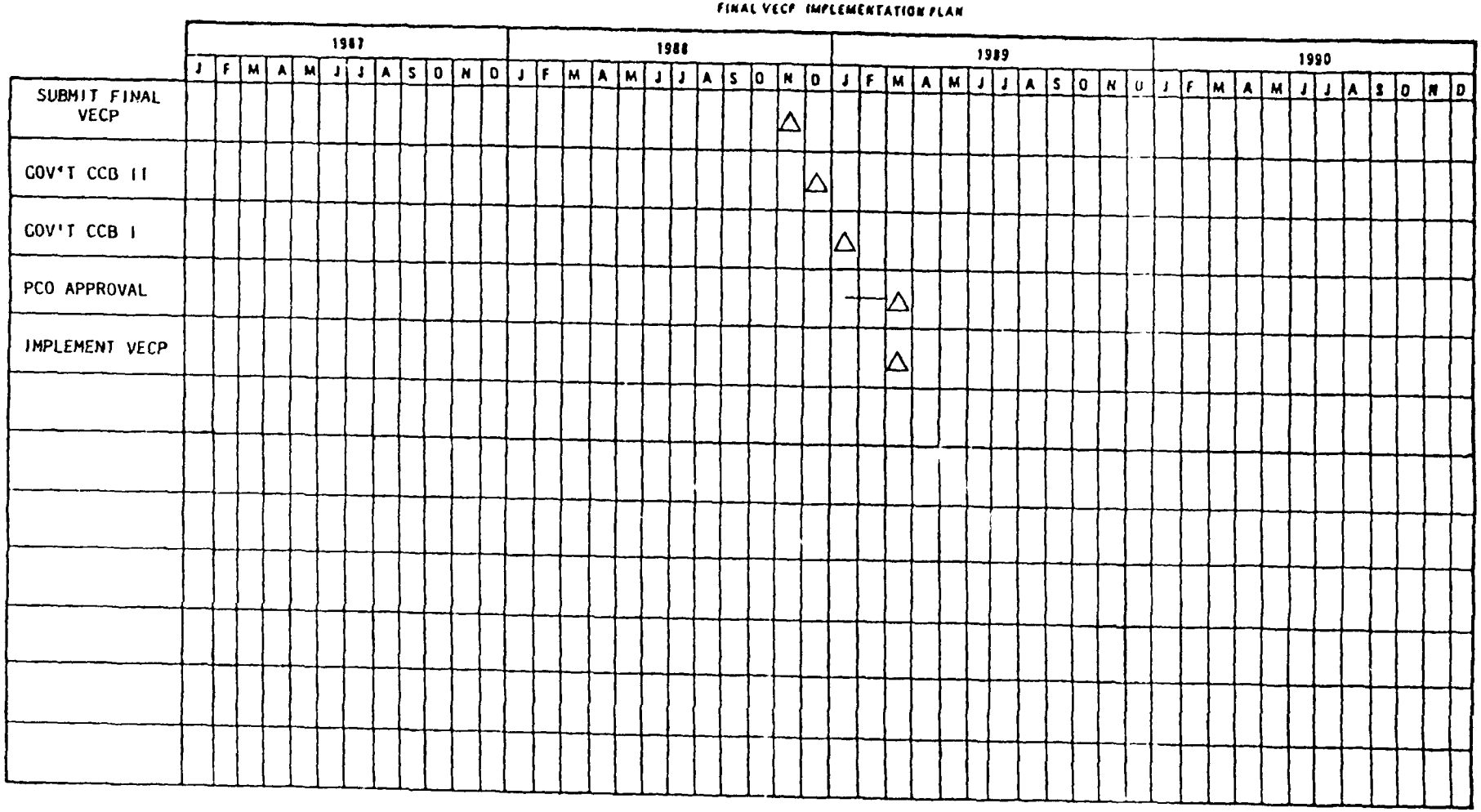
B. ACTIVITY AUTHORIZED TO APPROVE CHANGE FOR GOVERNMENT	SIGNATURE AND TITLE	DATE

10. ACTIVITY ACCOMPLISHING REVISION	REVISION COMPLETED (SIGNATURE)	DATE

DD FORM 1695

MILESTONE PLAN

FINAL VECP IMPLEMENTATION PLAN



VALUE ENGINEERING CHANGE PROPOSAL SUMMARY

PROCURING AGENCY		TECHNICAL AGENCY		VECP NUMBER
AMCCOM [X]	ARDEC [ ]	TMAS [X]	ARDEC [ ]	0520E0014 R-C

SUBMITTAL DATE	APPROVAL REQUIRED BY	TO IMPLEMENT BY	CONTRACT NUMBER
18 NOVEMBER 88		LOT 1 FY '89	DAAA09-88-C-0520
AFFECTING		**PERISHABILITY OF SAVINGS**	**CONTRACT END ITEM**
559,600 UNITS		$_____/MONTH	M865/M831

DESCRIPTION OF CHANGE

A. REDIMENSION BUFFER PIECE FOR PRODUCTION MFG. & INCREASE THICKNESS TO 3/4" FROM 5/8".

B. DECK DUNNAGE CHG. SIZE TO 3/8 X 4 (2 PCS.) FROM 3/8 X 17 3/4 & 18 3/4. ADDED 6 NAILS.

NEED FOR CHANGE (ADVANTAGES):

COST REDUCTION & ALLOW CONTAINERS TO FIT.

ELEMINATE NON-FUNCTIONAL WOOD DECKING PIECES.

COST CHANGE SUMMARY	FACTORY COST	WITH G&A
		$_____%
Present Method		
Material	23.18	
Labor		
Burden		
Proposed Method		
Material	21.16	
Labor		
Burden		
	2.02	
÷ 30 =		
	$ .0670 / UNIT	$ .0743 / UNIT
DEVELOPMENT AND IMPLEMENTATION COSTS		
T.S.D. Eng.		
TRAVEL		
Gov't Range Cost	NO COST	
	$_____	$_____

"These data furnished under the VE clause of Contract No _____ shall not be disclosed outside the Government or duplicated, used or disclosed, in whole or in part, for any purpose other than to evaluate a VECP submitted under the clause. This restriction does not limit the Government's right to use information contained in these data if it has been obtained or is otherwise available from the contractor or from another source without limitations."

A. INSTANT CONTRACT SAVINGS — NONE

AFFECTED QUANTITY*		_____
GROSS SAVINGS		_____
DEVEL. & IMPL. COSTS		_____
NET SAVINGS		_____
GOV. SHARE	_____%	_____
TSD SHARE	_____%	_____

*If multiyear use funded quantity only

B. CONCURRENT CONTRACT SAVINGS — NONE

CONTRACT NO.	QUANTITY	SAVINGS

Use separate sheets for details.

C. FUTURE ACQUISITION SAVINGS

	QUANTITY	SAVINGS
FY '89	171.6K	$ 12,750
FY '90	162 K	$ 12,036
FY '91	226 K	$ 16,792
SUBTOTALS	559.6K	$ 41,578
OFFSET D&I COSTS		$ 0
NET SAVINGS TO BE SHARED		$ 41,578
GOV. SHARE	50 %	$ 20,789
TSD SHARE	50 %	$ 20,789

D. COLLATERAL SAVINGS (ONE AVERAGE YEAR) — NONE

GOV. SHARE	_____%	_____
TSO SHARE	_____%	_____

☆ U.S. GOVERNMENT PRINTING OFFICE 1989 644-667 82098

GOC 22